Ontario

Emissions Reduction Trading System for Ontario

A DISCUSSION PAPER

March 2001

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Preface

This document outlines a proposed emissions reduction trading system for Ontario that is designed to help accelerate reductions in emissions of specific pollutants that contribute to air quality problems in Ontario.

The proposed trading system is part of the provincial government's commitment to improve air quality in Ontario, and will assist in Ontario achieving its air quality goals established in the Anti Smog Action Plan and the Canada Wide Acid Rain Strategy for Post 2000.

This document discusses the background of the development of the emissions reduction trading system to date, the major features of the proposed cap, credit and trade system, the fundamental framework of the proposed system, and a discussion of key issues and how they have been addressed to date.

The Ministry of the Environment is seeking the feedback from interested individuals and organizations on the contents of this document. Individuals and organizations wishing to offer their comments on this document are asked to provide them in writing to:

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Comments may also be provided by e-mail to:
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Written comments are requested within 90 days of the public release of this document.

All written and e-mail comments received will be reviewed, and will assist in the development of the regulation that will establish the legal context for the proposed emissions reduction trading system.

Background

The quality of our air continues to be among the top priorities for the Ministry of the Environment. Currently, Ontario is taking real, meaningful steps to cut air pollution across all sectors.

More than 50 per cent of Ontario's smog comes from U.S. sources. Ontario is actively supporting the U.S. Environmental Protection Agency's legal fight to introduce tough new emission limits in the United States. Ontario Government initiatives like Drive Clean, the Anti-Smog Action Plan, and Mandatory Monitoring and Reporting for air emissions are broadening the range of air quality actions to include more individuals, industries and communities. Air quality, after all, is everybody's business.

The various initiatives of Ontario's Air Quality Strategy recognize that air quality issues are interrelated. We recognize that dealing effectively with smog or acid rain, for example, can have significant co-benefits diminishing the threat of climate change, and vice versa.

To reflect this interrelatedness, we are shifting away from single issue management toward a broad, comprehensive approach. We are championing stringent and continuously improving air quality standards, while making our enforcement measures tougher than ever. Between these two posts, we are putting a broad set of innovative environmental tools and incentives in place.

Emissions Trading is a perfect example of this new strategic direction. It relies on tough emissions limits and strict enforcement, but also offers an innovative new way of reaching air quality targets. It is an inclusive system that rewards any emitter who goes beyond what is required by regulation.

Emissions trading's system of monetary incentives and disincentives can even reach beyond Ontario's borders to other jurisdictions that share our airshed. Due to prevailing wind patterns, emissions sources that affect air quality in Ontario can often be found hundreds of kilometres southwest of the U.S.-Canada border – territory Ontario environmental regulators are unable to touch.

Emissions trading is a system as adaptable as it is broad. Trading infrastructure established for nitrogen oxides (NOx) could easily be

adapted to cover greenhouse gases. Thanks to its flexibility, emissions trading is poised to become a key environmental policy tool for the Ministry of the Environment.

Ontario is in a good position to turn the proposals into action. The province has been a participant in the Pilot Emission Reduction Trading (PERT) program since 1996. This pilot has demonstrated that emissions trading can achieve emissions reductions effectively, sometimes even beyond regulatory requirements.

In the U.S., emissions trading is already a proven concept. The U.S. Environmental Protection Agency's Acid Rain SO_2 trading program has been in effect since 1995 and has stimulated early emissions reductions that went far beyond regulatory requirements.

Similarly, the Greater Los Angeles Area – which has been covered by a regional emissions trading program for NOx and SO_2 since 1994 – is consistently reporting over-compliance (i.e. over-achievement) with its established emissions reduction goals.

Emissions trading in Ontario was first proposed as part of a new air quality announcement package on January 24, 2000. In an Environment Ministry stakeholder workshop held on February 28 of that year, representatives from industry, universities, government, and non-governmental organizations (NGOs) lent the concept of emissions trading their broad support.

This paper provides details of the *Cap, Credit and Trade* emissions trading system proposed for Ontario. It also provides a basis for further consultation on key issues. Additional feedback will be sought from stakeholders as regulations are drafted.

Major Features of the Proposed Cap, Credit and Trade System

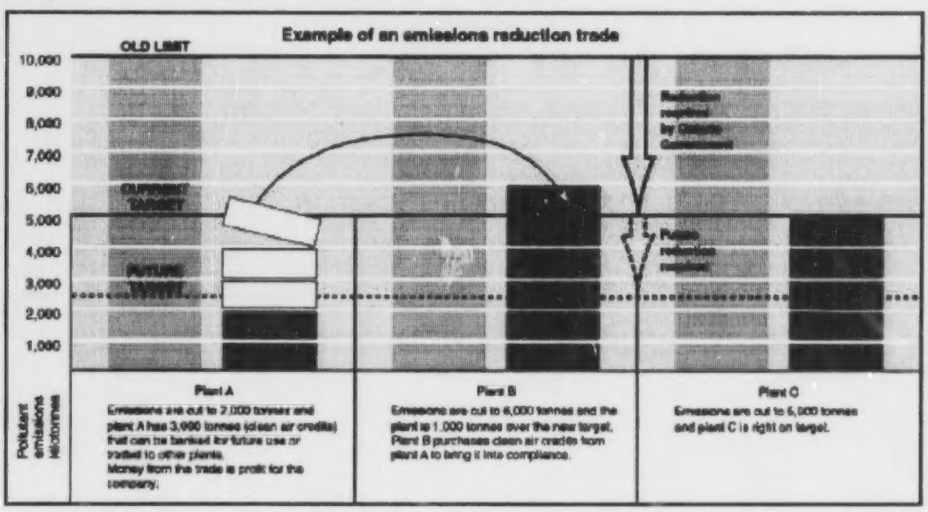
Emissions reduction trading is an innovative new pollution reduction system that makes polluters pay, while rewarding businesses that reduce their air emissions.

How does it work?

It all starts with stringent new air emissions limits (caps) on the pollutants NOx and SO_2 for Ontario's fossil fuel power sector. New air emissions limits are what the system is really all about. Over time, these limits will be lowered even further, which will guarantee better air quality in Ontario.

Rewarding all emitters for lowering their emissions – and putting up those reductions for sale as Emissions Reduction Credits (ERCs) to emitters having difficulty meeting their own reduction goals – will help Ontario reduce emissions and improve over all air quality more quickly.

To ensure that Emissions Trading is successful, it will occur with complete public disclosure, and with regular audits and reports.



The major features of the proposed system are:

CAPS AND ALLOWANCES FOR FOSSIL FUEL POWER STATIONS

- The pollutants that are subject to caps and eligible for emissions allowance and emissions reduction credit trading in Ontario are:

  - **NOx** (oxides of nitrogen), which are precursors to the formation of ozone, a major constituent of smog and a known health hazard, and;

  - **SO_2** (sulphur dioxide), a primary ingredient of acid rain and a precursor to the formation of acid aerosols, which can be inhaled and are known to be a health hazard.

  Both of these pollutants are known to negatively affect air quality – sometimes hundreds of kilometres from their source.

- Emissions limits, or caps, are set for the total emissions of a group of emitters. Initially, this will be the six coal- and oil-fired power stations of Ontario Power Generation Inc. (OPG), formerly known as Ontario Hydro. These are Atikokan, Thunder Bay, Lambton, Nanticoke, Lakeview, and Lennox. Collectively, their proposed year 2001 cap for NOx is 36 kilotonnes (kt), measured as NO, and 157.5 kt for SO_2. These six OPG facilities will continue to be covered by the emissions cap imposed on them even if they are sold, or operating responsibility for them is transferred to other owners or operators.

- The caps for emissions from the electricity sector will be reduced over time to ensure that the sector always shoulders a fair share of Ontario's long-term emission reduction targets. (See Table A)

- Capped facilities will have to meet all other environmental regulations or requirements, including limited emissions rates of NOx, SO_2 and other substances that will be included in their Certificate of Approval for the plant.

- Capped emitters are deemed to have met the capping regulation if their annual emissions are less than the total of the

allowances they use (retire) plus the emissions reduction credits they retire. See Glossary for definitions.

- Allowances for the capped facilities will be distributed by the government based on a system/process defined by government.

- Power plants may sell surplus allowances, which acts as a reward for good environmental performance.

TRADEABLE CREDITS ARE INCENTIVES FOR EMISSIONS REDUCTION

- All emitters in Ontario (and most other jurisdictions) must meet environmental standards; but not all emitters face caps under the cap and trade regulation. Emissions Reduction Credits (ERCs) can be created by non-capped emitters in Ontario's airshed. All credits are produced through investments or operational measures that reduce emissions below any regulatory requirements. In the year they are created, credits can be sold to capped entities that require them. Credits may also be banked for future in-house use, or for eventual sale to capped entities.

- Credits must be for reductions that are real, quantifiable, verifiable, surplus, and unique.

- Credit trading, along with extending caps to other sectors and reducing existing caps for future years, ensures that incentives for continuous emissions improvements remain strong.

- Credits are expected to increase in cost as the least-cost opportunities for emissions reductions are exhausted. This cost increase could be offset by decreasing costs for pollution control technologies.

TRADING CREDITS AND ALLOWANCES

- The advantages of emissions allowance trading and emissions reduction credit trading (collectively known as emissions trading) are significant:

  ! Trading creates incentives for emissions reductions beyond those required by regulation. The prospect of earning additional revenues by minimizing emissions motivates all businesses and organizations to reduce emissions.

  ! Trading creates incentives for emissions reductions for industries in jurisdictions beyond the regulatory reach of Ontario but who contribute pollution to Ontario's airshed.

  ! Trading ensures that investments in pollution abatement can be linked directly to increases in a corporation's profits; a lack of such investments, on the other hand, would lead to non-productive costs in the form of credit purchases.

  ! Trading promotes innovation in emissions reduction technology and related financing.

  ! Trading increases flexibility in how air quality goals are met.

  ! Trading reduces the cost of compliance. Air quality targets can be reached more cost-effectively than through a blanket application of regulatory limits, which ignores variations in equipment ages, industrial processes, and cost structures among emitters.

TABLE A

For NOx:
The proposed caps for net NOx emissions for the electricity system are shown below (in kilotonnes):

Year	Lakeview	4 Coal and 1 Oil	Other Electric Generation
2001*	3.9	32.1	***
2002	3.9	32.1	***
2003	3.9	32.1	***
2004	3.9	22.1	10
2005	1.3	22.1	12.6
2006	**	22.1	13.9
2007	**	18	10

*** numbers may be pro-rated to reflect a partial year**
**** limits for Lakeview if it operates as a natural gas fired station are part of the cap for "Other Electric Generation".**
***** no annual net NOx emission limits. All stations must respect other environmental regulations (e.g. Certificates of Approval) under the Environmental Protection Act.**

For SO2:
The proposed caps for net SO2 emissions for the electricity sector are 157.5 kilotonnes (kt) in 2001* and 131 kt in 2007 and beyond.

* numbers may be pro-rated to reflect a partial year.

Emissions Reduction Trading Framework

Conceptually it is useful to separate the cap, credit and trading system into five parts: establishing the cap; allocation of allowances; credit creation: credit and allowance use; and trading. The role for the government is different in each.

Establishing the Cap

- The government sets caps based on an assessment of the costs and benefits of different limits applied to different sets of emitters, after considering the impacts of various emissions limits on factors such as health and environmental issues, industrial competitiveness, and fairness.

Allocation of the Allowances

- The government allocates allowances to emitters capped by the regulation based on issues of fairness, efficiency, time-frames etc. Use of a transparent system provides more certainty for capped emitters.

Credit Creation

- The trading system depends on the definition, in regulation, of rules to encourage innovation by all emitters to find emission reduction opportunities.
- The government will facilitate development of structures/processes (protocol reviews) that provide guidance for credit creation; and will develop rules to maximize transparency in credit creation, to define verification and certification requirements which will be described in codes developed by or for the Ministry. The Ministry will ensure that such codes will be accessible to all interested persons.

Credit and Allowance use

- The use of credits and allowances, combined with the level of the caps, determines year to year emissions and is therefore crucial to protecting air quality.
- The government will enforce regulations and will have strong,

high profile presence. Capped emitters would be required to ensure that their annual emissions are less than the total of the allowances they own and retire plus the emissions reduction credits they own and retire; and, that their emissions reduction credits are verified for their conformance to regulations governing their use in Ontario.

Trading

- Trading is the buying and selling of credits and allowances.
- The government will assume a low profile role. It will facilitate development of structures (e.g. the registry) for trading, verification, certification, and scrutiny by the public of credits.
- An Ontario based registry could be based on the registry currently used by the Pilot Emissions Reduction Trading project (PERT), or on other registries being used or developed in North America.

Emissions trading is a tool to assist society in reaching goals for improving air quality as quickly as possible. The degree to which air quality improves is determined largely by the emissions caps and other emissions reductions programs which are adopted, as well as by incentives that encourage emitters to reduce their emissions.

Issues

The proposals which follow, for each of the 15 issues identified, create a strong government presence in the "credit allowance and use", create a transparent system for "allocation of allowances", and use less prescriptive approaches in the areas of "credit creation" and "trading".

1 Measurement of Emissions

2 Use of ERCs and Allowances

3 Airshed, Distance and Directionality

4 Banking of ERCs and Allowances

5 Allocation of Allowances to Capped Emitters

6 Ten Percent Discount of All ERCs Created

7 Method of Setting Emission Baseline for Creation of ERCs

8 Life of ERC Creation Initiatives

9 Credit for Reductions Prior to Implementation of Trading Program (Credit for Early Action)

10 Future Caps and Baseline Protection

11 Verification of ERCs

12 The Role of the Registry

13 Seasonality

14 Double Counting

15 New NOx Sources

1 Measurement of Emissions

Emitters capped by the Cap and Trade Regulation will need to provide evidence of their annual emissions. Should special monitoring equipment be required, or are a variety of estimation methods acceptable?

Proposal

! All emitters capped by the Cap and Trade Regulation, and over a specified size (based on annual emissions) will be required to install continuous emission monitors (CEMs), or parametric emissions monitoring equipment which has a demonstrated accuracy conforming to that specified in the regulation. Emitters below the specified size will be allowed to use estimation methods that are proven to be conservative and are approved by the MOE for use in Ontario.

Other Options Considered

! Allow a variety of estimation methods on a case by case basis.

! Require the use of CEMs on all capped emitters.

Considerations

! While precise emissions data are desirable, resources devoted to measuring the emissions could reduce resources available to reduce emissions.

2 Use of ERCs and Allowances

ERCs can be purchased and retired along with allowances assigned to the emitter (and additional allowances purchased from other capped emitters) to ensure that net emissions from the capped emitter are less than or equal to its assigned cap. Credits must be retired by the capped emitter if its gross emissions exceed the allowances it presents to government. Are limits on the use of ERCs needed?

Proposal

- ERC and foreign allowance use for NOx will be limited to 33% of total Ontario allowances used each year. This will help protect air quality since it means gross emissions from the capped generators will be lower than their emissions in the year the capping regulation was proposed.

- ERC use for SO2 will be limited to 10% of total Ontario allowances used each year. Allowances issued by other jurisdictions and purchased for use in Ontario may be accepted as ERCs if they lead to emissions reductions which are real.

- The limit will help protect air quality since it means that gross emissions from the capped generators will be lower than their emissions in the year the capping regulation was proposed.

- Capped emitters whose emissions exceed the sum of their allowances plus acceptable ERCs will face penalties.

Other Options Considered

1 Require that a proportion of current year emissions be covered by current year allowances/ERCs (i.e., limits on inter-temporal use).

2 Specify a discount on the value of banked ERCs/allowances depending on how many are being used at any one time.

3 No limits on ERC or allowance use.

Considerations

- Option 1 could discourage early credit creation (i.e. discourage early emissions reductions that result in the creation of credits), and is administratively burdensome.

- Option 2 is more burdensome administratively; and, could result in a disincentive for the creation of ERCs.

- Option 3 facilitates the development of a market but raises concerns about excessive use of credits to support increased use of coal.

3 Airshed, Distance and Directionality

Directionality: Emissions reductions made upwind of Ontario will improve air quality in Ontario. The use of ERCs created by sources upwind of Ontario will encourage further emissions reduction activity by upwind emitters, resulting in further air quality improvements in Ontario. Credits created upwind must meet the same criteria for legitimacy that apply to credits created in Ontario. Credits must result from contaminant reductions that are in excess of regulatory requirements in the jurisdiction in which they are created.

Proposal

- **Directionality:** Allowances and ERCs may be traded freely but the permitted use of ERCs to meet emissions obligations in Ontario will be limited to those that originate from local sources, or sources upwind from the Ontario-based user. The upwind wedge that delineates the Ontario airshed will be defined in regulation based on average winds. The currently proposed wedge for NOx is West-North-West to South-South-East (see Figure 1). The currently proposed wedge for SO2 is North-east to West, to South-east (see Figure 2).

    - Allowances issued by Ontario will not be subject to a directionality rule for use in Ontario.

- **Distance:** The location where the ERCs originate will also affect their value to Ontario air quality. The value of ERCs to Ontario's air will diminish as the distance between the Ontario ERC user and the origin of emission ERCs increases.

    - Allowances issued by Ontario will not be subject to a distance rule for use in Ontario.

Allowances issued by jurisdictions outside Ontario may qualify for use as an ERC in the Ontario regulation. They may need to meet criteria, in addition to the criteria applied to ERCs, acceptable to the government of Ontario to ensure that their use in Ontario would confer a benefit on Ontario air quality.

Proposal for NOx

- **Distance:** ERCs would be discounted as the distance between their place of origin and the Ontario ERC user increases (less than 300 km = no discount; greater than 1500 km = no value; between 300 km and 1500 km = formula discount: see Figure 3); or, on the basis of scientific evidence acceptable to MOE submitted at the time of credit retirement (use).

Figure 1: Upwind Wedge for NOX

An emitter, in this case in Toronto, may use a credit from the heavily shaded area to meet its NOX emissions reduction obligations.

- For emissions sources having a height above ground level of less than 30 metres, no credit will be given if the distance is greater than 300 km.

Proposal for SO2

- **Distance:** ERCs would be discounted as the distance between their place of origin and the Ontario ERC or allowance user increases (less than 300 km = no discount; greater than 3000 km = no value; between 300 km and

3000 km = formula discount: see Figure 4); or, on the basis of scientific evidence acceptable to MOE submitted at the time of credit retirement (use)

- For emissions sources having a height above ground level of less than 30 metres, no credit will be given if the distance is greater than 300 km.

Other Options Considered

1 No rules on distance or directionality.

2 Setting a 500 km limit within which no distance discounting will be required

3 Rules on distance and directionality for trading of allowances or credits generated within Ontario, and ERCs and allowances meeting Ontario's eligibility criteria which originate outside the province.

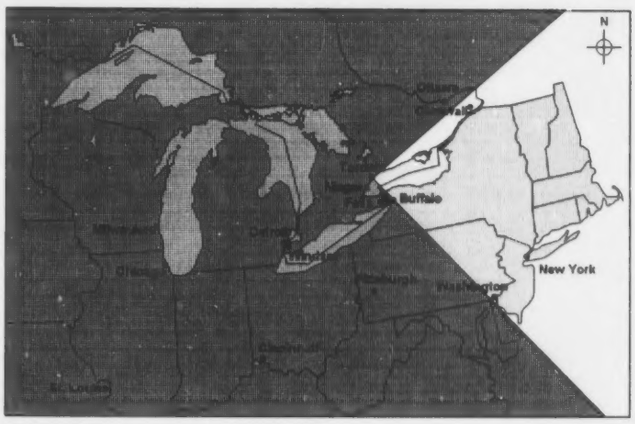
Considerations

- While distance and directionality have been ignored in some U.S. trading regimes, there is evidence distance and direction do matter.

- 300 km may be more protective of the Ontario airshed than 500 km. More scientific investigation may show that there is little difference in protectiveness between 300 and 500 km.

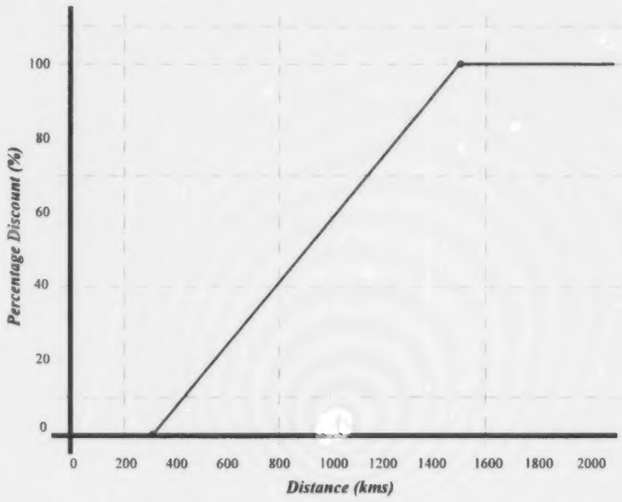
- On the other hand, the United States EPA has considered different geographical zones for both NOx and SO2 trading and has chosen against using them. Their experience is that distance and directionality rules in a cap and trade system add to complexity with very little added environmental benefit.

Figure 2: Upwind Wedge for SO2



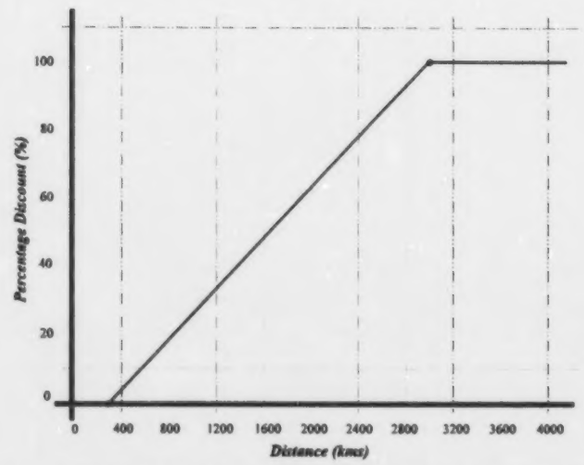
An emitter, in this case in Toronto, may use a credit from the shaded area to meet its SO2 emissions reduction obligations.

Figure 3: Discount vs. Distance for NOX Credits



The graph shows proposed discounts. For example, a credit from a source 300 kms away from the emitter offering the credit for retirement would face no discount. A credit from a source 1200 kms away from the emitter offering the credit for retirement would be discounted by 75%.

Figure 4: Discount vs. Distance for SO_2 Credits



The graph shows proposed discounts. For example, a credit from a source 300 kms away from the emitter offering the credit for retirement would face no discount. A credit from a source 2200 kms away from the emitter offering the credit for retirement would be discounted by 70%.

Questions for Discussion

- Are the distance and directionality rules appropriate to maximize improvement in Ontario's air quality?

4 Banking of ERCs and Allowances

Banking is defined as the carryover of unused ERCs or allowances from one year for use in another (i.e., storing emissions credits for future use). To what extent should banking be allowed?

Proposal

- Banking of emission reduction credits (ERCs) and allowances will be allowed without restrictions.

Other Options Considered

1 Banking of allowances would be allowed but the value of banked allowances would decline to zero over a five year period.

2 Banking of ERCs is allowed; banking of allowances is not allowed.

3 Retire unused allowances/ERCs in bank after they reach a certain age.

4 Require that the value of banked allowances/ERCs decay over time.

Considerations

- The ability to bank emissions credits is an important risk management tool for capped emitters and encourages early emissions reductions among uncapped emitters, which is good for the environment. The ability to bank allowances is important in affecting decisions by capped emitters to continually reduce emissions.

- Option 1: Allowance bank accounts (i.e., allowance inventories) would be managed on a LIFO basis (**L**ast **I**n **F**irst **O**ut). This would mean that when withdrawals from the bank are made to honour emissions obligations, the allowances being withdrawn would be of the most recent vintage issued by MOE.

  Purchases of allowances from others would also be subject to the LIFO rule. For example, a three year old allowance originally allocated to Plant A that is purchased by Plant B would have less value than a one year old allowance in meeting B's emissions obligations.

- Option 2: The banking of allowances is an important factor in maintaining an incentive for capped emitters to reduce emissions.

- Options 3 and 4: Unlike allowances, which are allocated gratis by government, ERCs must be purchased by the emitter. Forcing emitters to purchase assets that could

depreciate to zero before they can be used to honour an obligation would be counter productive and could retard emissions reduction activities.

Mandatory depreciation of ERCs could distort the market for ERCs and impair economic efficiency by creating a "use 'em" or "lose 'em" decision making behaviour. Electricity producers may conclude that, faced with a depreciating supply of ERCs, it makes sense to increase production (and therefore emissions) in order to realize value from the banked ERCs before they depreciate to zero.

Emitters could deliberately hold off on ERC purchases in order to avoid building ERC inventories that may turn out to have reduced, or no, value. This could signal a lack of demand for ERCs among those entities in positions to create them, discouraging early credit creation. Then, when the capped emitter realizes it has under-estimated its need for ERCs, there may not have been enough created to meet that need.

Question for Discussion

- Should banked allowances decline in value as a means of ensuring emitters continue to search for ways to reduce emissions?

5 Allocation of Allowances to Capped Emitters

A procedure is needed for allocating the emission allowances among emitters owned by different companies capped by the Cap, Credit and Trade regulation.

Using NOx as the example and recognizing that the government intends: to initially cap total emissions from the 6 fossil stations currently owned by OPG; to extend the cap in 2004 to other operators; and, to have allowances partitioned between the original 6 fossil stations and the remaining fossil stations; then, the issue is how to allocate the allowances in 2004 and beyond among the stations not currently owned by OPG.

In the initial period until 2004, allowances equal to the cap will be allocated at the beginning of the compliance period to OPG

for its coal and gas-and-oil fired generating stations for a number of years. OPG will distribute the allowances to each of these stations (Atikokan, Thunder Bay, Lambton, Nanticoke, Lennox). As stations are sold OPG will define the number of allowances to be transferred by OPG to the new owner of a station for future years as part of the sale of the station.

The partitioning of the electricity sector's allowance pool by segregating OPG's allocation for a number of years from that of the rest of the sector when it is brought under the cap will assist government's decontrol goals by providing OPG the flexibility it needs to divest itself of generating assets in a manner that does not diminish asset values, and affords OPG the flexibility it needs to develop its asset divestiture strategy.

In 2004, when additional generators are brought under the cap, additional allowances will be allocated by government, or according to a process defined by government, to these additional generators. Thus, when the additional generators are capped, the capped electricity sector will be partitioned for the purposes of allowance allocation. See Table A, page 7.

This partitioning of the electricity sector for the purposes of allowance allocation will remain in effect for at least three years.

Proposal

- When generators (in addition to the initial six OPG stations) are capped, allowances will be allocated by government to these additional generators (at the end of the year) based on each station's electricity production during the year. For example, a station generating 25% of the total power generated by all additional stations would receive 25% of the allowances. If the cap for the additional generators is 10 kt, then this would be 2.5 kt.

Other Options Considered

- Three other formula-based approaches have been suggested:
  1 Assignment to ALL electricity generators which sell their production to the grid on the basis of their energy production.

2 Assignment for the year to come to capped generators based on previous years' emissions.

3 Assignment to capped generators based on fuel use.

- Auction of allowances at the start of each year (could be revenue neutral) is a non-formula-based approach.

Considerations

- The Proposal:
  - Allocation based on electricity production benefits clean generators with the lowest emission rates (i.e., lowest emissions per unit of production). Setting a transparent allocation system will assist new companies planning entry to Ontario's electricity market. It is recognized that future cap levels beyond 2007 are also important to this.
  - No barriers are created to the market entry of new producers after 2004 because allowances will be allocated to new producers as well as existing producers based on their energy production.
  - Allocation at the end of the year avoids a risk associated with setting allocations based on emissions rates. Allocating based on emissions rates depends on forecast electricity sales and therefore allows the possibility that emissions could rise beyond the intended cap if sales exceed forecast levels.
- Option 1:
  - would allocate some allowances, all of which would be surplus, to existing hydraulic and nuclear generating facilities, which would then be in a position to sell allowances to fossil fired generators. This would impose a cost penalty on coal stations.
- Option 2:
  - administratively simple

- provides more certainty to capped emitters at the start of the year
- could reward dirty producers for being dirty, and penalizes cleaner ones for being clean.

- Option 3:

  - administratively simple
  - dirtier fuels could receive more allowances than cleaner fuels, which is the reverse of the intent of emissions trading. In the case of fuel *quantity* being the criterion, inefficient generators would be rewarded and efficient ones penalized.

- Auctioning:

  - auctioning is theoretically the allocation method that would result in the greatest degree of economic efficiency. It is administratively burdensome, and requires a mechanism to re-circulate the proceeds of the auction.

6 Ten Percent Discount on All ERCs Created

PERT (the Pilot Emissions Reduction Trading project) and a number of other ERC trading programs require that 10% of all ERCs created be retired as a contribution to the environment.

Proposal

- Adopt the PERT practice of requiring 10% of ERCs used be retired, so that only 90% of an ERC presented and accepted may be used by emitters for meeting compliance obligations.

- Retirement will occur at the time of use. ERCs purchased from upwind entities outside Ontario that have already been discounted as a contribution to the environment will not be required to be discounted when used to meet an emissions obligation in Ontario, except to meet distance discounting requirements. Where no environmental discount has been applied by foreign jurisdictions to ERCs created by sources outside of Ontario, the Ontario discount will apply.

Other Options Considered

1 No requirement to retire a percentage of the ERCs that are created.

2 Increase the percentage of ERCs that must be retired as a contribution to the environment.

3 Retirement would occur at the time of creation (of the ERC).

Considerations

- The 10% of ERCs removed from the system provides an immediate environmental benefit; and, it helps offset concerns about the use of credits.
- Option 1: The 10% retirement is good for the environment, and also encourages confidence in the trading system, particularly among persons unfamiliar with the concept, and advantages, of emissions trading.
- Option 2 would increase the costs to the participants in emissions trading. At some point, costs will deter participation in the market. 10% appears to be a discount that is meaningful to the environment, yet also unlikely to discourage early credit creation, which could delay improvements in air quality.
- Option 3 would result in the retirement of credits that may end up being purchased for use in a jurisdiction not requiring such a retirement.

7 Method of Setting Emission Baseline for Creation of ERCs

Emissions Reduction Credits (ERCs) can be created when actions are taken to reduce emissions below baseline emission rates. The method of setting the baseline emissions will affect the quantity of ERCs that can be created.

Proposal:

- The emissions baseline for any source will be set against emission rates in the year prior to the credit creating action being taken. Credits result from actions taken at a project level rather than a corporate level. An example of a corporate action resulting in a reduction in emissions of the corporation is the outsourcing of production to another corporation. In such cases, the societal emissions are not reduced by outsourcing, the environment is not improved, and credits are therefore not created by it. Similarly, credits cannot be created by a company that reduces its emissions by going out of business or by cutting back on production.

- Note that reductions occur every day following the implementation of an emissions reduction action. However, credits can only be claimed using a 12 month accumulation period.

Other Options Considered

1 Case by case negotiated baseline.

2 Historical loading (i.e., emission tonnage)

3 Set baselines based on emissions from a corporation rather than from a project.

Considerations

- Using emissions rates rather than emissions levels encourages companies who are expanding production to exploit market opportunities to seek out ways to reduce the emissions intensity of their products.

- Option 1, which would require negotiations between the government and the credit creator, is not transparent and requires expert knowledge by the government of industry processes and emissions control technologies.

- Option 2 does not reward improvements in emissions per unit of output, and in energy efficiency, and does not allow for economic growth. Also, it allows credits to be created through plant closures or economic downturns.
- Option 3 requires a more extensive data base on emissions from a corporation and is sufficiently more cumbersome that

reduction activity beyond that required by regulation would be deterred.

8 Life of ERC Creation Initiatives

Emissions reduction credits (ERCs) can be created when actions are taken to reduce emissions below baseline emission rates. Should an emission source receive ERCs for its efforts indefinitely (i.e., for the life of the ERC producing investment) ?

Proposal

- ERCs from an initiative would be eligible for use in Ontario to meet an Ontario emissions obligation for a period of five years from the date the initiative becomes operational (i.e., the date of the commencement of credit creation), or until emissions from the subject facility or sector are included in cap and trade regulations, or other emissions regulations reduce allowable emissions.

- Emitters would not be barred from requesting a longer credit creation eligibility period. Where actions incur a substantial capital cost, or both a capital cost and substantial ongoing cost (i.e. each year an action may be required in order to sustain the creation of ERCs), there may be justification for allowing credits that are created after the five year period expires to be accepted by MOE for use in Ontario, possibly at a reduced rate.

Other Options Considered

1 ERCs can be created for the life of the project against historical baseline

2 Reduce the number of ERCs allowed from each project by 10% per year (a declining baseline)

Considerations

- A five year limit would contribute to long term NOx and SO2 reduction goals by ensuring that the ERCs are not simply transferred (i.e. sold) indefinitely to other facilities operating

under emission caps. At the same time, five years is an adequate period of time for a proponent to realize an acceptable financial rate of return on the ERC creation investment.

- Other jurisdictions may choose to allow the use of ERCs after the five year eligibility period established for the use of ERCs in Ontario.
- Option 1: All sectors are expected to reduce emissions.
- Option 2: An annual depreciation in credit eligibility would adversely affect the financial rate of return on the proponent's ERC creation investment, and as a result discourage ERC creation, which in turn would retard achievements in air quality improvements. Also, it is less administratively straightforward to administer and monitor.

9 Credit for Reductions Prior to Implementation of Trading Program (Credit for Early Action)

It is expected that there will be emission sources that took action to reduce emissions prior to implementation of the trading program and will want to receive credit for their actions. Should sources that reduced emissions in advance of the program be allowed to claim credit under the trading program, and if so, what conditions should apply?

Background:

Credit for early action (in reducing emissions) may be one of the most controversial issues in the introduction of an emissions reduction trading program. Encouraging early action is seen to be one of the keys to keeping the cost of meeting emission reduction targets low. At the same time there is a legitimate concern about "anyway credits" - allowing emitters to earn credits (and therefore to allow increased emissions in the future when those credits are retired) for actions they were likely going to undertake anyway (because of what were likely to have been planned changes in processes unrelated to air quality considerations).

"Anyway credits", though a useful concept in understanding emissions reduction trading, is difficult to define in practice because it requires knowledge of decision makers' thinking when decisions are made that affect emissions.

There is also a concern because no one knows the precise inventory of NOx or SO2 emissions either this year or in past years; so, it is not clear what volume of NOx or SO2 credit would be associated with different credit for early action rules.

The government has also asked all emitters to make early emission reductions and to contribute their fair share of emission reductions to the overall provincial target of a 45% reduction by 2015 of 1990 emission levels for NOx and a 50% reduction from the Countdown Acid Rain cap for SO2 by 2015. Some emitters have made voluntary commitments which meet or exceed these requests, and have taken early action to address these voluntary commitments. How should the government request, and the associated voluntary commitments, be considered when deciding what credits can be created for actions undertaken prior to credit creation rules being finalized?

To date there has not been adequate discussion of options, and no preferred option has emerged to guide discussion about how to deal with credit for early action at the start-up of the trading system in Ontario. A number of options are described below to help focus future discussions.

Options

1 Allow ERCs to be created only by actions taken from the time the regulation comes into force.

2 The Ministry will give credit, with a discount of 5 to 1, for early action for ERCs based on actions taken between July, 1998 (the date of the signing of the Letter of Understanding between the Minister and the PERT participants) and January 24, 2000 (the date the government's intention to introduce emissions reduction trading was announced) to be eligible (subject to trading rules yet to be developed) when submitted for use if registered with the MOE within 6 months of the regulation coming into force.

3 Discount vintage ERCs according to a declining rate of 10% per year from the date of the action being taken that resulted in the ERC creation.

4 Emitters will only be able to create credits if their total emissions are being reduced in line with the government requests to contribute to the 45% reduction target. Emitters who have made voluntary commitments which exceed these requests will not see their ability to produce credits for early action eroded. The number of credits created will be determined based on the decisions made in regard to "Method of Setting Emission Baseline for Creation of ERCs" when facilities' total emissions are below the government-defined path that leads to the 45% target.

5 Allow ERCs to be created based on actions taken back to 1996, the formal starting date of PERT.

Considerations

- On July 8, 1998, the Minister of the Environment signed a Letter of Understanding (LOU) with PERT members. The LOU provides PERT participants with some assurance that their efforts to reduce emissions will be considered in a future formal trading system. It states that credits created as part of the PERT project would be subject to the rules of the formal trading program.

- Emitters (ASAP (Anti Smog Action Plan) participants, for example) that reduced their NOx emissions in 1997 may wish to claim credit. If such emission sources do not receive credit then they may be penalized next to emission sources that have not improved but are now able to receive credit for future improvements.

- Options such as 2:
  - limit the number of credits in play at the start of the regulation
  - do not reward actions taken before the regulation comes into force.

- Option 3 lacks the simplicity of establishing a cutoff date.

- Option 5: An over-abundance of credits would be created, and that this would depress the price of ERCs. This in turn would reduce the incentive for emissions reductions from capped emitters and the creation of ERCs through new initiatives, thus retarding the improvement in air quality in Ontario.

Question for Discussion

- Should credits created before the announcement of the intent to create a cap, credit and trade system (i.e. January 24, 2000) be discounted somehow? If not discounted, should their use be limited in some way?

10 Future Caps and Baseline Protection

Emitters and sectors have expressed concern that if they face regulated caps in the future, the level of the cap will be reduced if they take early action to reduce emissions, thus penalizing them compared to companies that took no action. The government does not want to penalize entities that have taken early action.

Proposal

Caps will be set after consideration of historical emissions trends, the provincial reduction targets, current year emissions, and credit creation activities.

Considerations

Baseline protection for setting appropriate future caps is a fundamental element for the MOE policy in setting caps. However, there can be a link between decisions allowing credits to be created for actions prior to caps being established, and the initial level of the cap. For example, the existence of a large number of registered credits allows lower caps to be set as new sectors are brought under the cap. A large number of credits and lower caps are both good for the environment because they result in lower emissions and improved air quality.

Question for Discussion

- How should the setting of emission caps take into account early action and whether credits have been created as a result of early action; and, the number of registered credits from other sectors?

11 Verification of ERCs

To ensure the integrity of emission reduction credits (ERCs) used in Ontario, the Ministry must have a system for ensuring the validity of ERCs as real and that their use conforms to the Ministry's trading regulation.

Proposal

- The trading regulation will define requirements for credit creation and list acceptable credit creation technologies, actions, and quantification methods (i.e. approved protocols).

- The ERCs will be verified by a 3rd party or parties named by MOE. MOE will confirm the validity of the ERCs at time of use by checking to ensure that verification has taken place.

- Once satisfied that verification has occurred, and that the ERC is being used in conformance with Ontario's trading regulations, (e.g. that distance and directionality requirements have been met), MOE will certify, or cause to be certified by a 3rd party or parties, the ERCs for use in Ontario to meet the obligation of the specific emitter.

- The user will be responsible for providing evidence, in the form of a verification document, of the validity of ERCs submitted for use. In the case of certification by a 3rd party or parties, the user will be responsible for providing evidence of such certification.

- As part of the validation process, MOE may require that all ERCs presented for use in Ontario must first be placed on an Ontario registry.

- Codes will be developed to define requirements for credit creation protocols and quantification and verification reports. These codes will define the process for adding new credit creation technologies and actions to the list of those that are acceptable.

Other Options Considered

1 MOE examines the acceptability of the ERCs when they are submitted for compliance use. The user will be responsible for providing evidence of the validity of ERCs submitted for use. ERCs presented to MOE would be subject to a detailed review on a random basis. (Not all ERCs used would be reviewed in detail.)

   Codes will be developed to define requirements for credit creation protocols and quantification and verification reports.

   MOE uses the EBR (Environmental Bill of Rights) Registry to notify of its intention to accept a credit for use and to invite comment.

2 MOE itself verifies and certifies ERCs when they are created, before they are sold.

Considerations

- The proposal provides greater certainty to credit creators who have chosen recognized credit creation technologies and actions. This will facilitate the development of a market by clearly identifying credit creation opportunities and by reducing transaction costs.

- Option 1 provides ongoing opportunities for public input on the acceptability of specific credits before decisions are made on their acceptability; but, could cause substantial uncertainty among credit creators and the regulated users of the credits, thus impeding the development of a market, and emission reduction activity.

  - User liability for use of invalid ERCs would be the incentive for participants to ensure ERCs they create, purchase or use would pass any verification test at time of use.

- An active MOE presence in reviewing the use of ERCs is needed to ensure credits have resulted from real emissions reductions. When submitted for use, MOE has various options to check for 'bad' ERCs including conducting its own audit of suspect ERCs.

- Option 2 provides greater control for the MOE over the acceptance of credits. MOE is concerned about verifying those ERCs that will be used in Ontario to meet an Ontario obligation. ERCs created in Ontario may or may not be used in Ontario. MOE can avoid unnecessary resource utilization by focusing its attention only on those ERCs used here. ERCs destined for use in Ontario will not become known until they are actually offered for use.

12 The Role of the Registry

A trading registry is a useful tool to assist the functioning of the market, and in assisting the integrity of credit trading. At minimum the registry would be useful in facilitating trading and tracking origin, ownership and use of ERCs. The registry could also play a role in assessing the technical validity of ERCs before they are submitted to MOE.

Proposal

- A private sector registry which wishes to assist the market in Ontario, would review ERC documentation in line with the Ontario regulation for completeness or validity and post the ERCs for trading (tracking of ownership and use). MOE will determine the acceptability of the credits for use in Ontario notwithstanding the position or opinion of a registry regarding the validity of the credits. MOE would have final say on the validity and use of ERCs by certifying them, or by causing them to be certified, prior to retirement.

Other Options Considered

1 Registry guarantees validity of ERCs posted on the registry by verifying (doing a technical assessment) of ERCs and/or applying an insurance premium to safeguard against "bad" ERCs subsequently identified by MOE.

2 Registry scrutinizes (perhaps using a third party) only ERCs which are 'first of a kind' but does not guarantee ERCs.

Considerations

- Option 1 increases transaction costs. Random audits at the time of use are effective, as well as economic.
- Option 2 may result in failure to detect errors in methodology, and impairs quality control.

13 Seasonality

NOx emissions are a greater concern in the summer than in the winter because NOx reacts in the presence of heat and sunlight to produce ozone, an important constituent of smog and a known threat to health.

Proposal

- NOx emissions reduction credits must be identified according to the season in which they are created.
- The ozone season will be the five month period from May 1 to September 30. The non-ozone season will be the seven month period from October 1 to April 30.
- Ozone season NOx credits retired must reflect the ratio of emissions in the ozone season to those outside the ozone season.

Other Option Considered

- Do not distinguish between ozone season and non-ozone season.

Considerations

- More ozone is produced per unit of NOx emitted in the summer than in the winter. A NOx credit based on reductions realized in the winter that is used to meet an

emissions reduction obligation in the summer does not reflect this difference.

- Without an ozone season requirement, an Ontario emitter could buy cheaper non-ozone season ERCs from sources outside Ontario. This would dilute the effectiveness of emissions trading as a tool to assist in improving air quality, and would impede the achievement of Ontario's air quality goals.

- The United States has to date focussed on the ozone season. Retaining the distinction between ozone season and non-ozone season facilitates the possible future integration of the emissions trading system with the system in use in the United States.

14 Double Counting

Electricity generators who provide power to the grid, and electricity users who undertake demand management measures to reduce their power consumption from the grid, would like to receive credit for reducing demand for fossil-fired electricity, and thus the NOx and SO2 which would have been emitted by that electricity production.

Proposal

- ERCs from uncapped electricity generators which reduce their own NOx and SO2 emissions rates, and DSM (demand side management) initiatives at uncapped emitters which reduce their own NOx and SO2 emissions rates, will be recognized for use in Ontario.

- ERCs from uncapped electricity generators which reduce or displace electricity from capped emitters, and DSM projects which reduce or displace electricity from capped emitters, will not be allowed to create credits eligible for use in Ontario.

Other Options Considered

1 Allow credits for new sources which produce electricity from capped emitters, or for DSM which displaces electricity produced by capped emitters, based on assumptions about

what sort of electricity generation (coal, nuclear, hydraulic) a new source replaces or DSM initiative displaces.

2 Assignment of some portion of the cap to potential new energy sources (especially renewable energy sources) and DSM projects

3 Allocate emission allowances to ALL generators based on generation

Considerations

- Fossil-fired electricity production from five coal fired power stations and one oil fired station in Ontario will face NOx and SO2 caps in 2001 and beyond. Allowing new electricity sources to displace this fossil fuel and to create credits is in many situations double counting. Double counting occurs as follows: The new source would free up the capped emitters' allowances (or reduce an emitter's need to purchase credits) by displacing fossil fuel. The freed-up allowances could then be used to allow emissions increases. The credits created would also allow emissions increases. Thus the double count.

- Equally, allowing DSM, which reduce the use of fossil fuel by capped emitters, to create credits also risks double counting.

- Option 1: Allowing the use of these credits would result in the double counting of credits.

- Option 2 could constitute a direct subsidy from coal plant owners to new/renewable and DSM projects.

- Option 3: A significant proportion of Ontario generation is from hydraulic and nuclear facilities, and providing them with allowances would amount to a direct subsidy from coal stations to these other sources.

Question for discussion

- Can cap, credit and trade systems be used to provide greater incentives for new renewable energy sources and demand side management while still respecting short term emissions caps? If so should renewable energy sources

wishing to sell their power at a premium ("green power" sources) be eligible to generate credits recognizing that purchasers willing to pay a premium probably pay the premium to ensure that pollution reductions are occurring?

15 New NOX Sources

Should new NOx sources be allowed to create credits that are eligible for use in Ontario?

Proposal

- New NOx sources such as new uncapped power stations or co-generation plants cannot create credits only by displacing electricity production from capped electricity generators.
- New NOx sources can create credits by lowering emissions from other on-site emission sources (e.g. by lowering the emissions from a plant that is being served by the new NOx source).

Other Option Considered

- Allow credits to be generated based on the NOx production allowed by applicable regulations and other legal instruments

Considerations

- Credits must result from and reflect real reductions in emissions. New sources of emissions cannot reduce emissions unless they can be linked directly to reductions elsewhere.
- It is not clear that the credits created by the other option reflect real reductions.

Question for discussion

- Can cap, credit and trade systems be used to provide incentives so that new NOx sources are designed to minimize NOx output?

Conclusions

The proposed system can provide a workable cap, credit and trade system for use starting 2001 to help improve air quality in Ontario. The system will provide incentives for NOx and SO2 emitters in all sectors to reduce emissions below regulated levels, and to encourage all sectors of the economy to search out new emission reduction opportunities.

A number of issues remain that it may be possible to address as further discussion takes place and further experience is gained. Issues may develop as NOx and SO2 caps are extended to other emitters.

Questions noted in the paper are:

- Are the distance and directionality rules appropriate to maximize improvement in Ontario's air quality? (page 18)
- Should banked allowances decline in value as a means of ensuring emitters continue to search for ways to reduce emissions? (page 20)
- Should credits created before the announcement of the intent to create a cap, credit and trade system be discounted somehow? If not discounted, should their use be limited in some way? (page 30)
- How should the setting of emission caps take into account early action and whether credits have been created as a result of early action; and, the number of registered credits from other sectors? (page 31)
- Can cap, credit and trade systems be used to provide greater incentives for new renewable energy sources and demand side management while still respecting short term emissions caps? If so should renewable energy sources wishing to sell their power at a premium ("green power" sources) be eligible to generate credits recognizing that purchasers willing to pay a premium probably pay the

premium to ensure that pollution reductions are occurring? (page 36)

- Can cap, credit and trade systems be used to provide incentives so that new NOx sources are designed to minimize NOx output? (Page 37)

We encourage comments on all the issues discussed in this paper.

Next Steps

Regulations will be developed based on the proposed cap, credit and trade system described above, and on the comments received on this paper. Comments on the proposal can be addressed in writing or by e-mail to:

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Comments are requested within 90 days of the date of public release of this discussion paper.

Glossary

"activity" means the level of activity at an emission source, measured in terms of production, use or occupancy, raw materials input, vehicle kilometers -traveled, or other similar units.

"allowance" means a permit to emit a specified amount of a named substance. In the context of emissions reduction trading in Ontario it refers to permission, from government, to emit a specified amount of NOx or SO2.

"allocation" means the act of awarding emissions allowances to specific entities. In Ontario these entities, as a group or as groups, have had their emissions of NOx and SO2 capped at specified levels which cannot be exceeded without meeting specific requirements related to allowances and credits.

"area source" means those small or diverse stationary sources that are not individually included in a stationary source emissions inventory. The term area sources includes emissions related to consumer and commercial products.

"banking" means to own ERCs. It implies the ERCs have been registered, but not yet used.

"baseline" means the level of emissions below which reductions must occur for an emission reduction credit to be created from a source, process, or process equipment.

"certification" means the official approval of an ERC for use in meeting an emissions obligation in Ontario.

"credit" or "emission reduction credit" or "ERC" means a unit of reduction achieved by an uncapped emitter in actual emissions of a pollutant below a baseline, during a specified period, which is expressed in tonnes of pollutant reduced, that meets the conditions of the trading rules and regulations of Ontario and has been entered on the Registry.

"create" or "creation" means to create, or the act of creating, emission reduction credits.

"creation period" means the discrete period of time during which emissions are reduced and credits created.

"creator" means the party who signs and submits the Notice of Creation. In most cases the creator is the party which makes the economic investment in a creation strategy. Example 1: with stationary sources it is usually the owner or operator of the facility; however, a party could agree to install a credit creating technology at a non-owned source and become the creator. Example 2: in the case of a mobile source scrappage program, it would normally be the entity buying back the scrapped vehicle. Example 3: if a refiner makes credits by reducing the RVP of its gasoline, the refiner would normally be the creator; however, if the refiner makes the reduction because it has been paid to do so by another party, the other party is likely the creator.

"emission rate" means the mass of emissions from a source per unit of activity (e.g. nanograms per joule of heat input, grams per kilometer, kilograms per barrel of production, etc.).

"greenhouse gas" or "GHG" means any one of the following six gases or families of gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6).

"Ministry" means the Ontario Ministry of the Environment or other regulatory body which has been granted authority over the administration of this rule by the Ontario Ministry of the Environment.

"mobile source" means any vehicle or engine used for on-highway or non-road purposes, and the mobile-source related fuels and/or fuel delivery systems used by those vehicles or engines. For the purpose of this definition, non-road vehicles and engines include those used in construction, mining and farm equipment, marine vessels, locomotives, and airplanes.

"new source" means a source of emissions which results from a newly constructed plant, facility, process, or piece of equipment, or a facility modified so as to be considered by the Ministry as a new source.

"NOx" or "oxides of nitrogen" means all oxides of nitrogen, except nitrous oxide (N_20)

"NOx credit" means an ERC that is based on reductions of NOx.

"ozone season" means the time of year between May 1 and September 30, inclusive.

"protocol" means a written description of the quantification of an emission reduction credit creation or use. It shall be based on and address all topics contained in the appropriate Emission Reduction Credit Creation or Use Checklist.

"registry" means registry or registries designated by the Ministry, from time to time, as the system (electronic or other) which records and tracks the creation, transfer and use of ERCs.

"replacement source" means a new source which is specifically built to take over the production capacity of a shutdown source. A replacement source can be at the equipment level or facility level and either onsite or at a new location.

"retire" means to make an ERC or an allowance permanently unavailable for use. An ERC may be retired by using it to meet an emissions reduction obligation, or to confer a benefit on the environment by preventing its use in meeting an obligation.

"shutdown" means a source of emissions, whether a plant, facility, process, or piece of equipment, which reduces or ceases production.

"source" means any mobile, area, or stationary source.

"stationary source" means any facility or installation which emits or may emit an air pollutant and has a permanent geographical position.

"third party" or "third party auditor" means an independent third party licensed or certified in the Province of Ontario as a professional engineer, or other licensed professional organization as approved by the Ministry.

"use" means the application of ERCs to meet a voluntary or regulatory emission reduction obligation.

"user" means the owner or operator of a source which acquires

and uses ERCs to fulfill a voluntary or regulatory emission reduction obligation.

"use period" means the discrete period of time during which credits are used. In the case of using credits to meet a voluntary or regulatory reduction requirement, it is the period of time over which the user applies ERCs to meet said requirement. In the case of using ERCs to meet a penalty assessed by the Ministry, it is the time specified by the Ministry.

"validation" means, in general, the process of ensuring an obligation has been met.

"verification" means, specifically, ensuring that all of the measures taken to cause the creation of a credit, as described in the protocol, have taken place, and that the emissions reductions claimed have actually occurred.